Amendments to Claims

Listing of Claims:

This listing of claims replaces all prior versions and listings of claims in the application.

What is claimed is:

1. (Currently amended) An optical communications system employing radio frequency signals, the system comprising:

at least one ~~a central~~ optical transceiver unit in communication with at least one base station in a cellular wireless communications network, the at least one optical transceiver unit communicates reverse link radio frequency signals to the at least one base station and receives forward link radio frequency signals from the at least one base station;

at least one remote unit which is remote from the at least one optical transceiver unit, the at least one remote unit ~~which~~ provides a radio connection point for mobile terminals in an associated coverage area, the at least one remote unit comprising at least one optoelectronic transducer for converting optical data signals to radio frequency signals and converting radio signals to optical signals, and ~~,~~ at least one antenna to receive and send radio frequency signals;

at least one optical fiber data link between the at least one ~~central~~ optical transceiver unit and the at least one remote unit for transmitting optical data signals therebetween; and

at least one optical fiber power link between the at least one ~~central~~ optical transceiver unit and the at least one remote unit for providing electrical power at the at least one remote unit.

2. (Previously presented) The optical communications system according to claim 1 wherein the at least one optoelectronic transducer comprises an electroabsorption transceiver.

3. (Previously presented) The optical communications system according to claim 1 wherein the at least one optoelectronic transducer comprises a first optoelectronic transducer for converting optical data signals to radio frequency signals and a second optoelectronic transducer for converting radio frequency signals to optical signals.

4. (Previously presented) The optical communications system according to claim 3 wherein the first and second optoelectronic transducers are low power consumption devices.

5. (Previously presented) The optical communications system according to claim 4 wherein the second optoelectronic transducer comprises a VCSEL laser.

6. (Previously presented) The optical communications system according to claim 3 wherein the second optoelectronic transducer comprises an edge-emitting laser.

7. (Cancelled)

8. (Cancelled)

9. (Currently amended) The optical communications system according to claim 1, ~~8~~ further comprising:

a radio frequency combiner between the at least one optical transceiver unit and a plurality of base stations in the cellular wireless communications network for combining forward link radio frequency signals which are received from the ~~wherein the~~ plurality of base stations.

~~uni-directional optical fiber data link is in a direction from the central unit to the at least one remote unit.~~

10. (Currently amended) The optical communications system according to claim 1, ~~8~~ further comprising:

a plurality of optical transceiver units; and

a radio frequency combiner between the plurality of optical transceiver units and the at least one base station for combining reverse link radio frequency signals which are received from the plurality of optical transceiver units.

~~wherein the uni-directional optical fiber data link is in a direction from the at least one remote unit to the central unit.~~

11. (Currently amended) The optical communications system according to claim 1 wherein an optical fiber ~~transports~~ provides both the optical fiber data link and the optical fiber power link using wavelength division multiplexing.

12. (Currently amended) The optical communications system according to claim 10, ~~1~~ further comprising:

a radio frequency splitter in communication with a plurality of base stations in the cellular wireless communications network, and associated with the radio frequency combiner, which splits the combined reverse link radio frequency signals.

~~wherein the radio frequency signals are used in a wireless communications system.~~

13. (Currently amended) The optical communications system according to claim 1, ~~12~~ wherein the radio frequency signals comprise multiple radio carriers within multiple frequency bands with multiple protocols.

14. (Currently amended) The optical communications system according to claim 10, ~~1~~ wherein:

the radio frequency combiner is between the plurality of optical transceiver units and a plurality of base stations in the cellular wireless communications network.

~~the at least one remote unit comprises a first antenna to receive radio frequency signals and a second antenna to send radio frequency signals.~~

15. (Currently amended) An optical communications system employing radio frequency signals, the system comprising:

at least one ~~a central~~ optical transceiver unit in communication with at least one base station in a cellular wireless communications network, the at least one optical transceiver unit communicates reverse link radio frequency signals to the at least one base station and receives forward link radio frequency signals from the at least one base station;

at least one remote unit which is remote from the at least one optical transceiver unit, the at least one remote unit provides a radio connection point for mobile terminals in an associated coverage area, and comprises ~~comprising~~ means for converting optical data signals to radio

frequency signals, means for converting radio signals to optical signals, and at least one antenna to receive and send radio frequency signals;

at least one optical fiber data link between the at least one ~~central~~ optical transceiver unit and the at least one remote unit for transmitting optical data signals therebetween; and

at least one optical fiber power link between the at least one optical transceiver ~~central~~ unit and the at least one remote unit for providing electrical power at the at least one remote unit, the at least one remote unit further including means for converting optical power from the at least one optical fiber power link into electrical power, and means for converting the electrical power into a form that is required to power the means for converting optical data signals to radio frequency signals.

16. (Currently amended) A method for communicating between a central unit and a remote unit, said method comprising:

at the central unit, receiving forward link radio frequency signals from a plurality of base stations in a cellular wireless communications network;

at the central unit, combining the forward link radio frequency signals to provide combined forward link radio frequency signals;

based on the combined forward link radio frequency signals, communicating ~~receiving~~ an optical data signal from the central unit to a ~~at the~~ remote unit, which is remote from the central unit, via ~~through~~ an optical fiber data link;

communicating ~~receiving~~ radiation from the central unit to ~~at~~ the remote unit through an optical fiber power link to electrically power the remote unit;

converting the optical data signal to a radio frequency signal at the remote unit ~~through an optoelectronic transducer~~;

converting the radiation to electrical power at the remote unit;

amplifying the radio frequency signal obtained by the converting using the electrical power ~~obtained from the radiation in the optical fiber power link~~ to provide an amplified radio frequency signal; and

sending the amplified radio frequency signal into free space through at least one antenna connected to the remote unit.

17. (Currently amended) A method for communicating between a central unit and a plurality of ~~at least one~~ remote units, ~~unit,~~ said method comprising:

receiving radiation from the central unit at each ~~the at least one~~ remote unit through respective ~~an~~ optical fiber power links, ~~link~~ each remote unit is remote from the central unit;

at each respective remote unit, converting the radiation to electrical power to electrically power each ~~the~~ remote unit;

receiving a respective reverse link radio frequency signal at each remote unit from at least one antenna connected to the each ~~at least one~~ remote unit;

amplifying the respective reverse link radio frequency signal at each remote unit using the electrical power ~~obtained from the radiation in the optical fiber power link~~ to provide respective ~~an~~ amplified radio frequency signals; ~~signal;~~

converting the respective amplified radio frequency signals ~~signal~~ to respective ~~an~~ optical data signals ~~signal~~ at each ~~the at least one~~ remote unit ~~through an optoelectronic transducer~~; ~~and~~

transmitting the respective optical data ~~signal~~ signals from each remote unit to the central unit through respective ~~an~~ optical fiber data links; ~~link~~ and

at the central unit, converting the respective optical data signals to respective radio frequency signals, combining the respective radio frequency signals, and, responsive to the combining, communicating combined respective radio frequency signals to at least one base station in a cellular wireless communications network.

18. (Currently amended) An optical communications system employing radio frequency signals, the system comprising:

a central unit;

at least one remote unit, which is remote from the central unit, the at least one remote unit provides a radio connection point for mobile terminals in an associated coverage area, said at least one remote unit having first means for converting optical data signals to radio frequency signals and converting radio frequency signals to optical data signals, second means for converting optical data signals into baseband digital signals and converting baseband digital ~~digitals~~ signals to optical data signals, and at least one antenna to receive and send radio frequency signals, the second means communicates with a local area network;

at least one optical fiber data link between the central unit and the at least one remote unit, and associated with the first means, for transmitting optical data signals ~~therebetween~~;

at least one optical fiber data link between the central unit and the at least one remote unit, and associated with the second means, for transmitting optical data signals; and

at least one optical fiber power link between the central unit and the at least one remote unit for providing electrical power at the at least one remote unit.

19. (Currently amended) The optical communications system according to claim 18 wherein the baseband digital signals are used in a protocol of the local area network ~~protocol~~.

20. (Previously presented) The optical communications system according to claim 19 wherein the local area network protocol is Ethernet.

21. (Cancelled)

22. (Currently amended) The optical communications system according to claim 1, wherein:

the at least one remote unit comprises a photovoltaic converter for converting optical power from the at least one optical fiber power link into electrical power, and an amplifier coupled between the at least one optoelectronic transducer and the at least one antenna, the amplifier amplifies the radio frequency signals obtained by the converting of the optical data signals for transmission to the mobile terminals, the amplifier is coupled to the photovoltaic converter for receiving the electrical power.

23. (Currently amended) The optical communications system according to claim 1, wherein:

the at least one remote unit comprises at least one active component, a photovoltaic converter for converting optical power from the at least one optical fiber power link into electrical power, and a regulator for converting the electrical power into a constant voltage or a constant current form that is required to power the at least one active component.

24. (Currently amended) The optical communications system according to claim 10, ~~23,~~ further comprising:

~~wherein:~~

a plurality of respective remote units which provide respective radio connection points for mobile terminals in associated respective coverage areas, each respective remote unit is in communication with a different respective optical transceiver unit of the plurality of optical transceiver unit;

a different optical fiber data link between each respective optical transceiver unit and its respective remote unit for transmitting optical data signals therebetween; and

a different optical fiber power link between each respective optical transceiver unit and its respective remote unit for providing electrical power at the respective remote unit.

~~the regulator converts the electrical power into a constant voltage or a constant current form.~~

25. (Currently amended) The optical communications system according to claim 1, wherein:

the optical transceiver ~~central~~ unit comprises a first, high power laser diode coupled to the at least one optical fiber power link and a second laser diode coupled to the at least one optical fiber data link.

26. (Previously presented) The optical communications system according to claim 25, wherein:

the high power laser diode provides radiation on the at least one optical fiber power link with a power of about 500 mW.

27. (Previously presented) The optical communications system according to claim 25 wherein:

the high power laser diode provides radiation on the at least one optical fiber power link with a power of at least 2 W.

28. (Currently amended) The optical communications system according to claim 1, further comprising:

a plurality of remote units, each providing a radio connection point for mobile terminals in associated coverage areas;

at least one optical fiber data link between the at least one optical transceiver ~~central~~ unit and each of the remote units for transmitting optical data signals therebetween; and

at least one optical fiber power link between the at least one optical transceiver ~~central~~ unit and each of the remote units for providing electrical power at each of the remote units.

29. (Previously presented) The optical communications system according to claim 15, wherein:

the means for converting the electrical power converts the electrical power into a constant voltage or a constant current form.

30. (Cancelled)

31. (New) An optical communications system employing radio frequency signals, the system comprising:

a plurality of base stations in a cellular wireless communications network;

a central unit comprising a plurality of optical transceiver units and a radio frequency splitter-combiner, the radio frequency splitter-combiner is operatively provided between the plurality of optical transceiver units and the plurality of base stations;

a plurality of remote units which are remote from the central unit, each remote unit provides a radio connection point for mobile terminals in an associated coverage area, the plurality of remote units transmit forward link radio frequency signals to mobile terminals via respective antennas and receive reverse link radio frequency signals from mobile terminals via respective antennas, each remote unit is associated with a different one of the optical transceiver units; and

a different optical fiber data link and a different optical fiber power link between each remote unit and its associated optical transceiver unit.

32. (New) The optical communications system according to claim 31, wherein:

the radio frequency splitter-combiner combines forward link radio frequency signals which are received from the plurality of base stations.

33. (New) The optical communications system according to claim 31, wherein:

the radio frequency splitter-combiner combines reverse link radio frequency signals which are received from the plurality of optical transceiver units.

34. (New) The optical communications system according to claim 33, wherein:

the radio frequency splitter-combiner splits the combined reverse link radio frequency signals.